

TRANSMITTAL OF APPEAL BRIEF (Large Entity)

Docket No.
PO9-99-147

In Re Application Of: King et al.

OCT 28 2004

PATENT & TRADEMARK OFFICE

Application No.	Filing Date	Examiner	Customer No.	Group Art Unit	Confirmation No.
09/407,594	09/28/1999	Thomas K. Pham	46369	2121	2954

Invention: **METHOD, SYSTEM AND PROGRAM PRODUCTS FOR MANAGING LOGICAL PROCESSORS OF A COMPUTING ENVIRONMENT**

COMMISSIONER FOR PATENTS:

Transmitted herewith in triplicate is the Appeal Brief in this application, with respect to the Notice of Appeal filed on August 27, 2004

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Dated: October 26, 2004

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Appellants: King et al.

Group Art Unit: 2121

Serial No.: 09/407,594

Examiner: Thomas K. Pham

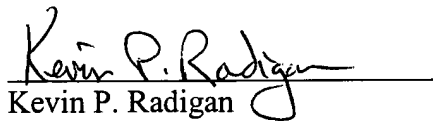
Filed: 09/28/99

Appeal No.:

For: METHOD, SYSTEM AND PROGRAM PRODUCTS FOR MANAGING
LOGICAL PROCESSORS OF A COMPUTING ENVIRONMENT

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Brief of Appellants

Dear Sir:

This is an appeal from a final rejection, dated May 28, 2004, rejecting claims 1-4, 6-7, 10-14, 16-17, 20-25, 27-28 & 31-34. Claims 8, 9, 18, 19, 29 & 30 have been allowed. This Brief is accompanied by a transmittal letter authorizing the charging of Appellants' deposit account for payment of the requisite fee set forth in 37 C.F.R. §1.17(c).

Appellants' Brief is being filed after the effective date of the final BPAI Rules, September 13, 2004 and, therefore, the format and content of Appellants' Brief is in compliance with the requirements set forth in 37 C.F.R. §41.37(c). If Appellants' Brief does not comply with the requirements set forth in 37 C.F.R. §41.37(c), Appellants request notification of the

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reasons for noncompliance and the opportunity to file an amended Brief pursuant to 37 C.F.R. §41.37(d).

Real Party In Interest

This application is assigned to **International Business Machines Corporation** by virtue of an assignment executed by the inventors on November 12, 1999; November 19, 1999; November 30, 1999; and December 3, 1999, and recorded with the United States Patent and Trademark Office at reel 010446, frame 0489, on December 9, 1999, and an assignment executed on September 10, 2001, and recorded with the United States Patent and Trademark Office at reel 014156, frame 0792, on June 9, 2003. Therefore, the real party in interest is **International Business Machines Corporation**.

Related Appeals and Interferences

To the knowledge of the Appellants, Appellants' undersigned legal representative, and the assignee, there are no other appeals or interferences that will directly affect or be directly affected by or have a bearing on the Board's decision in the instant appeal.

Status of Claims

This patent application was filed on September 28, 1999, with the U.S. Patent and Trademark Office. As filed, the application included thirty-one (31) claims, of which four (4) were independent claims (i.e., claims 1, 11, 21, & 22).

In an initial Office Action dated March 30, 2003, claims 1-4, 11-14 and 21-25 were rejected under 35 U.S.C. §102(e) as being anticipated by Ellsworth et al. (U.S. Patent No. 6,453,344; hereinafter "Ellsworth"), and claims 5-7, 10, 15-17, 20, 26-28 and 31 were rejected under 35 U.S.C. §103(a) as being unpatentable over Ellsworth in view of George et al. (U.S. Patent No. 5,659,786; hereinafter "George"). The Office Action indicated that claims 8-9, 18-19 and 29-30 would be allowable if rewritten in independent form, including all of the limitations of the base claim and any intervening claim. In Appellants' response dated July 10, 2003, claims 5,

15 and 26 were deleted and claims 1, 6-8, 10-11, 16-18, 20-22, 27-29 and 31 were amended, resulting in an additional three (3) independent claims (i.e., claims 8, 18 and 29).

In a second and final Office Action dated September 25, 2003, claims 8-9, 18-19 and 29-30 were allowed, claims 1-4, 11-14 and 21-25 were rejected under 35 U.S.C. §102(e) as being anticipated by Ellsworth, and claims 6-7, 10, 16-17, 20, 27-28 and 31 were rejected under 35 U.S.C. §103(a) as being unpatentable over Ellsworth in view of George. In Appellants' response dated November 25, 2003, no claims were amended.

In an Office action dated December 11, 2003, which withdrew the finality of the September 25, 2003 Office Action, claims 1-4, 11-14 and 21-25 were rejected under 35 U.S.C. §103(a) as being unpatentable over Ellsworth in view of Zalewski et al. (U.S. Patent No. 6,260,068; hereinafter "Zalewski") and claims 6-7, 10, 16-17, 20, 27-28 and 31 were rejected under 35 U.S.C. §103(a) as being unpatentable over Ellsworth in view of Zalewski and further in view of George. In Appellants' response dated March 9, 2004, independent claims 1, 11, 21 & 22 were amended and claims 32-34 were added.

In a final Office Action dated May 28, 2004, claims 1-4, 6-7, 10-14, 16-17, 20-25, 27-28 and 31-34 were rejected under 35 U.S.C. § 103(a) as being obvious over Ellsworth in view of Luke (U.S. Patent No. 5,168,544; hereinafter "Luke"), and further in view of Zalewski. In Appellants' response dated July 27, 2004, no claims were amended.

An Advisory Action issued August 25, 2004 responsive to appellants' July 27, 2004 request for reconsideration of the final Office Action. The Advisory Action indicated that appellants' request did not place the application in condition for allowance. A Notice of Appeal to the Board of Patent Appeals and Interferences was mailed on August 27, 2004.

The status of the pending claims is therefore as follows:

Claims allowed – 8-9, 18-19 and 29-30;

Claims objected to – none;

Claims rejected – 1-4, 6-7, 10-14, 16-17, 20-25, 27-28 and 31-34; and

Claims canceled – 5, 15 and 26.

Appellants are appealing the rejection of claims 1-4, 6-7, 10-14, 16-17, 20-25, 27-28 and 31-34.

Status of Amendments

Appellants proffered no amendments responsive to the final Office Action dated July 27, 2004. The claims as set out in the Appendix include all prior entered claim amendments.

Summary of the Claimed Subject Matter

In one aspect of the invention, appellants claim a method (independent claim 1), system (independent claim 11) and program storage device (independent claim 22) for managing logical processors of a computing environment wherein the method, for instance, comprises configuring a logical partition of the computing environment with one or more logical processors (see, e.g., FIG. 1; page 10, line 1 – page 11, line 11); automatically evaluating workload of the logical partition and automatically determining therefrom that the configuration of the logical partition is to be adjusted 704 (see, e.g., FIG. 7; page 30, line 17 – page 33, line 6); and dynamically adjusting the configuration of the logical partition 708, 712, 714 (see, e.g., FIG. 7; page 30, lines 17-20 & page 33, line 7 – page 34, line 9).

In a further aspect of the invention, appellants claim a system (independent claim 21) of managing logical processors of a computing environment, the system comprising one or more processors adapted to automatically evaluate workload of a logical partition and automatically determine therefrom that a configuration of the logical partition having one or more logical processors is to be adjusted and to dynamically adjust the configuration of the logical partition. (See, e.g., FIGS. 1 & 7; page 30, line 17 – page 34, line 9).

Ground of Rejection to Be Reviewed On Appeal

1. Whether claims 1-4, 6-7, 10-14, 16-17, 20-25, 27-28 and 31-34 were rendered obvious to one of ordinary skill in the art by Ellsworth in view of Luke and further in view of Zalewski, and therefore, properly rejected under 35 U.S.C. §103(a).

Argument

Rejection under 35 U.S.C §103(a) Over US Patent No. 6,453,344(to Ellsworth) in view of US Patent No. 5,168,544 (to Luke) and further in view of US Patent No. 6,260,068 (to Zalewski)

Claims 1-4, 6-7, 10-14, 16-17, 20-25, 27-28 and 31-34

Reversal of the rejection to claims 1-4, 6-7, 10-14, 16-17, 20-25, 27-28 and 31-34 as obvious over Ellsworth in view of Luke and further in view of Zalewski is respectfully requested.

Ellsworth describes a system in which the total number of available CPUs of the system are partitioned into one or more smaller pools of CPUs, such that a smaller pool contains the CPUs actually used by a user. This reduces the licensing costs of the system, since the user only pays fees for the CPUs of the pool, instead of paying fees for all available CPUs of the system. At a later time, the user may request additional CPUs to be added to the pool. That is, the user may request additional CPUs, if the user determines that more CPUs are desired and is willing to pay for these additional CPUs. Thus, in Ellsworth, any adjustment in the configuration is user determined and requested, and is not automatically determined based on an automatic evaluation as claimed by appellants.

In particular, appellants submit that Ellsworth does not teach or suggest appellants' claimed element of automatically evaluating workload of the logical partition and automatically determining therefrom that the configuration of the logical partition is to be adjusted. Instead, Ellsworth describes a manual process of reconfiguring an environment. That is, the user chooses whether the configuration is to be adjusted. This is specifically described throughout Ellsworth. As examples, in Col. 4, lines 1-2, it states: "[T]he user of the multiprocessor system 1-0 is able to establish domains ..." and in Col. 10, lines 4-15, it indicates that the customer may wish to change the number of off-line processors or the number of dedicated CPUs. Further, the examples of Cols. 10-11 recite that the user upgrades the machine and the user edits the profiles. Each of these examples, teaches that the determination to reconfigure is made by the user and the reconfiguration is at the user's request. It is not automatically determined based on an automatic evaluation, as claimed by appellants.

This deficiency of Ellsworth is recognized in the Office Action, which states that Ellsworth: "... does not show the automatically evaluating workload of the logical partition and automatically determining therefrom that the configuration of the logical partition is to be adjusted." The Office Action relies upon Luke for this feature. However, appellants respectfully submit that Luke also fails to teach or suggest at least this feature of their claimed invention.

Luke describes a computer implemented method by which trace data from concurrently executing virtual processors is reformatted and organized as a linked list of successive events evoking parallel activity for any given parallel task. A selective traverse of the links operates to drive time processed displays of processor utilization and executing hierarchy of parallel constructs. It is an object of Luke to devise a computer implemented method for analyzing the functional events occurring during parallel execution of a program to drive parallel process summary variables, parallel activity duration, and concurrency variables.

The final Office Action cites column 3, lines 65-68 of Luke for allegedly teaching "automatically evaluating resource utilization and parallelism with respect to the virtual processors for the purpose of computing the effective number of processors to be used." This characterization of the teachings of Luke is respectfully traversed. Column 3, lines 64-68 of Luke state:

It is accordingly an object of this invention to devise a computer-implemented method for evaluating resource utilization and parallelism with respect to computations executing concurrently on one or more virtual processors.

These lines of Luke discuss a goal of his invention as being evaluating resource utilization and parallelism with respect to computations executing concurrently. Thus, Luke seeks to evaluate the requirements of the computations (or program) itself executing concurrently under one or more virtual processors. This goal of Luke does not state as a goal the automatic evaluating of workload of the one or more processors, nor the automatic determination therefrom that configuration of the one or more virtual processors is to be adjusted. As summarized above, the purpose of Luke is to improve the efficiency of a program to be executed in parallel. This is accomplished by injecting trace points and then evaluating the trace point data (see column 4, lines 31-43).

In addition to there being no teaching or suggestion in Luke of appellants' recited functionality of automatically evaluating workload of the logical partition, appellants' respectfully submit that there is no teaching or suggestion therein of the further recited functionality of automatically determining therefrom that configuration of the logical partition is to be adjusted. The Office Action fails to address this aspect of appellants' recited invention.

The final Office Action states that Zalewski teaches the dynamic reconfiguration of a multi-processor computer system without intervention of the system administrator (Col. 4, lines 50-53, "In accordance with ... of the system administrator"). However, appellants respectfully submit that a careful reading of Zalewski fails to uncover any discussion or suggestion that the workload of the logical partition is automatically evaluated and that based upon this automatic evaluation, there is a automatic determination that configuration of logical partition is to be adjusted.

Col. 4, lines 50-53 of Zalewski state:

In accordance with the principles of the invention, the migration can be initiated and carried out under control of the operating system instance "on the fly" without intervention of the system administrator.

The term "system administrator" in Zalewski appears to be an individual acting in a hardware administrator role, i.e., as an operator at a hardware console to set up and reconfigure a machine. Col. 7, lines 46-49 of Zalewski, state: "For example, a partition may be uninitialized due to a lack of sufficient resources at power up to run a primary CPU or when a system administrator is reconfiguring the computer system." This context implies a hardware console operation role for the system administrator since the partition is not initialized and cannot perform anything. Col. 29, lines 4-6 state: "This migration may take place under control of a system administrator or may be initiated by an operating instance without system administrator participation." Appellants respectfully submit that this sentence implies a delineation between the hardware role of the system administrator and a software (operating system instance) role.

A careful reading of Zalewski fails to uncover any suggestion or implication for workload driven automation of a reconfiguration of resources as recited by appellants.

Col. 4, lines 60-62 of Zalewski further state:

In accordance with this model, a first operating system instance which requires a resource first requests the resource from the second instance.

A careful reading of Zalewski fails to uncover any suggestion that the requirement for a resource is in any way related to an automatic evaluation of workload of a logical partition or an automatic determination therefrom that configuration of the logical partition is to be adjusted. Absent such teaching, appellants respectfully submit that there is no suggestion in the applied art of the recited technique for managing logical processors of a computing environment. To the extent that a resource can migrate from one partition to another in Zalewski, without system administrator intervention, could simply be the result of a command being executed by one of the instances. There is no suggestion that migration results from an automatic evaluation of workload of an instance.

Based on the foregoing, appellants respectfully request reconsideration and withdrawal of the rejection stated in the final Office Action. In addition to the substantive traversal of the rejection, appellants also respectfully submit that the justifications in the Office Action for combining Ellsworth, Luke and Zalewski are deficient. The Office Action alleges that it would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate the teachings of Luke with the logical processors of Ellsworth because “it would provide for the purpose of computing the effective number of processors to be used for processing a task” (a characterization which appellants traverse). Further, the Office Action alleges that it would have been obvious to one of ordinary skill in the art at the time of the invention was made to incorporate the “automatic configuration of Zalewski with the system of Ellsworth and Luke because it would provide for the purpose of reconfiguring the resource partitions without rebooting the whole system” (again, a characterization which appellants traverse to the extent relevant to their recited workload driven automation of the reconfiguration of the logical partition). Noticeably absent from these justifications as any express teaching, suggestion or incentive identified in the art itself for making the proposed combination. Just as in Winner International Royalty Corp. v. Wang, 11 F.Supp.2d 18, 48 U.S.P.Q.2d 1139 (D.D.C. 1998), *aff’d* 202 F.3d 1340, 53 U.S.P.Q.2d 1580 (Fed.Cir. 2000), *cert. denied*. 530 U.S. 1238 (2000), wherein the Court overturned a Board finding of obviousness, hindsight is always perfect and it is

insufficient to prove at the time of the claimed invention that the separate elements of the process were present in the know art. “Rather, there must have been some explicit teaching or suggestive in the art to motivate one of ordinary skill in the art to combine such elements so as to create the same invention.” Id. Winner’s cited authority, Arkie Lures, Inc. v. Gene Larew Tackle, Inc., 119 F.3d 953, 43 U.S.P.Q.2d 1294 (Fed.Cir. 1997), similarly holds that:

It is insufficient to establish obviousness that the separate elements of the invention existed in the prior art, absent some teaching or suggestion, in the prior art, to combine the elements.

The above justifications do not identify a teaching, suggestion or incentive in the art to combine the references as required by cases like Winner and Arkie. The justifications for the two combinations are simply restatements of the alleged results of the combination, rather than a reason for the combination drawn from the prior art or from the knowledge available to one of ordinary skill in the art.

Upon a review of Ellsworth, Luke and Zalewski, appellants respectfully submit that there is no teaching, suggestion or incentive for the combination. In fact, as discussed above in detail, the teachings of each are believed deficient with respect to appellants recited processing of automatically evaluating workload of the logical partition and automatically determining therefrom that the configuration of the logical partition is to be adjusted. Since the justifications offered in the final Office Action provide no technical basis outside that contained in appellants’ own specification, it merely attempts to restate the combination in hindsight, which violates the well known principle that appellants own disclosure cannot be used as a reference against them. The consistent criterion for determination of obviousness is whether the prior art would have suggested to one of ordinary skill in the art that the claimed invention should be carried out and would have a reasonable likelihood of success, viewed in light of the prior art. Both the suggestion and the expectation of success must be found in the prior art, not in appellants’ disclosure.

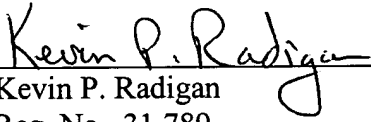
For the above reasons, appellants respectfully request reversal of the obviousness rejection to independent claims 1-4, 6-7, 10-14, 16-17, 20-25, 27-28 and 31-34.

Conclusion

Appellants respectfully request reversal of the rejection set forth in the final Office Action. Appellants submit that Ellsworth in view of Luke and further in view of Zalewski would not have rendered the functionality recited in their claimed invention obvious. These patents do not, individually or in combination, teach or suggest appellants' recited independent claims, which include: (1) configuring a logical partition of a computing environment with one or more logical processors; (2) automatically evaluating workload of the logical partition and automatically determining therefrom that the configuration of the logical partition is to be adjusted; and (3) dynamically adjusting the configuration of the logical partition.

Accordingly, reversal of the rejection is respectfully requested.

Respectfully submitted,


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Appendix

1. A method of managing logical processors of a computing environment, said method comprising:

configuring a logical partition of said computing environment with one or more logical processors;

automatically evaluating workload of the logical partition and automatically determining therefrom that said configuration of the logical partition is to be adjusted; and

dynamically adjusting the configuration of the logical partition.

2. The method of claim 1, wherein said dynamically adjusting is in response to workload of said logical partition.

3. The method of claim 1, wherein said dynamically adjusting comprises increasing a number of logical processors allocated to said logical partition.

4. The method of claim 1, wherein said dynamically adjusting comprises decreasing a number of logical processors allocated to said logical partition.

5. (Canceled)

6. The method of claim 1, wherein said automatically determining is performed at a plurality of time intervals.

7. The method of claim 1, wherein said automatically determining comprises using a predefined equation in making the determination.

8. A method of managing logical processors of a computing environment, said method comprising:

configuring a logical partition of said computing environment with one or more logical processors;

determining that said configuration is to be adjusted, said determining comprising using a predefined equation in making the determination, the predefined equation comprising:

$$L = \text{floor}[\max(W, U) * P + 1.5], \text{ wherein}$$

L = number of logical processors configured to said logical partition;

W = percentage of central processor capacity assigned to said logical partition;

U = percentage of central processor capacity currently being utilized by said logical partition; and

P = number of physical processors that can be allocated on the central processor associated with said logical partition; and

dynamically adjusting the configuration.

9. The method of claim 8, wherein said equation is subject to a maximum of $L = P$.

10. The method of claim 7, wherein said automatically determining further comprises comparing a result of said predefined equation with one or more thresholds to determine whether the adjustment is to be made.

11. A system of managing logical processors of a computing environment, said system comprising:

means for configuring a logical partition of said computing environment with one or more logical processors;

means for automatically evaluating workload of the logical partition and automatically determining therefrom that said configuration of the logical partition is to be adjusted; and

means for dynamically adjusting the configuration of the logical partition.

12. The system of claim 11, wherein said means for dynamically adjusting is in response to workload of said logical partition.

13. The system of claim 11, wherein said means for dynamically adjusting comprises means for increasing a number of logical processors allocated to said logical partition.

14. The system of claim 11, wherein said means for dynamically adjusting comprises means for decreasing a number of logical processors allocated to said logical partition.

15. (Canceled)

16. The system of claim 11, wherein the automatically determining is performed at a plurality of time intervals.

17. The system of claim 11, wherein said means for automatically determining comprises means for using a predefined equation in making the determination.

18. A system of managing logical processors of a computing environment, said system comprising:

means for configuring a logical partition of said computing environment with one or more logical processors;

means for determining that said configuration is to be adjusted, said means for determining comprising means for using a predefined equation in making the determination, the predefined equation comprising:

$$L = \text{floor}[\max(W, U) * P + 1.5], \text{ wherein}$$

L = number of logical processors configured to said logical partition;

W = percentage of central processor capacity assigned to said logical partition;

U = percentage of central processor capacity currently being utilized by said logical partition; and

P = number of physical processors that can be allocated on the central processor associated with said logical partition; and

means for dynamically adjusting the configuration.

19. The system of claim 18, wherein said equation is subject to a maximum of $L = P$.

20. The system of claim 17, wherein said means for automatically determining further comprises means for comparing a result of said predefined equation with one or more thresholds to determine whether the adjustment is to be made.

21. A system of managing logical processors of a computing environment, said system comprising:

one or more processors adapted to automatically evaluate workload of a logical partition and automatically determine therefrom that a configuration of the logical partition having one or more logical processors is to be adjusted and to dynamically adjust the configuration of the logical partition.

22. At least one program storage device readable by a machine, tangibly embodying at least one program of instructions executable by the machine to perform a method of managing logical processors of a computing environment, said method comprising:

configuring a logical partition of said computing environment with one or more logical processors;

automatically evaluating workload of the logical partition and automatically determining therefrom that said configuration of the logical partition is to be adjusted; and

dynamically adjusting the configuration of the logical partition.

23. The at least one program storage device of claim 22, wherein said dynamically adjusting is in response to workload of said logical partition.

24. The at least one program storage device of claim 22, wherein said dynamically adjusting comprises increasing a number of logical processors allocated to said logical partition.

25. The at least one program storage device of claim 22, wherein said dynamically adjusting comprises decreasing a number of logical processors allocated to said logical partition.

26. (Canceled)

27. The at least one program storage device of claim 22, wherein the automatically determining is performed at a plurality of time intervals.

28. The at least one program storage device of claim 22, wherein said automatically determining comprises using a predefined equation in making the determination.

29. At least one program storage device readable by a machine, tangibly embodying at least one program of instructions executable by the machine to perform a method of managing logical processors of a computing environment, said method comprising:

configuring a logical partition of said computing environment with one or more logical processors;

determining that said configuration is to be adjusted, said determining comprising using a predefined equation in making the determination, the predefined equation comprising:

$$L = \text{floor}[\max(W, U) * P + 1.5], \text{ wherein}$$

L = number of logical processors configured to said logical partition;

W = percentage of central processor capacity assigned to said logical partition;

U = percentage of central processor capacity currently being utilized by said logical partition; and

P = number of physical processors that can be allocated on the central processor associated with said logical partition; and

dynamically adjusting the configuration.

30. The at least one program storage device of claim 29, wherein said equation is subject to a maximum of $L=P$.

31. The at least one program storage device of claim 28, wherein said automatically determining further comprises comparing a result of said predefined equation with one or more thresholds to determine whether the adjustment is to be made.

32. The method of claim 1, wherein the dynamically adjusting comprises dynamically adjusting the configuration of the logical partition without negotiating with another logical partition of the computing environment.

33. The system of claim 11, wherein the means for dynamically adjusting comprises means for dynamically adjusting the configuration of the logical partition without negotiating with another logical partition of the computing environment.

34. The at least one program storage device of claim 22, wherein the dynamically adjusting comprises dynamically adjusting the configuration of the logical partition without negotiating with another logical partition of the computing environment.

* * * * *